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THIRD UNITED NATIONS CONFERENCE ON THE EXPLORATION AND PEACEFUL USES OF OUTER SPACE

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Abstract of the national paper of the Russian Federation

Main results of the recent space activity of the Russian Federation

Preparation of the draft Russian Federation space programme for the period up to 2005 has now been completed.

The orbital network of spacecraft operated by Russia is carrying out assignments in a range of basic areas. The configuration of the current orbital network reflects its orientation towards providing solutions to major problems in the socio-economic realm and maximizing the economic impact obtained.

Satellite communications and television transmission constitute the most highly developed area of space services. The orbital network of the space communications, television transmission and navigation system comprises the Gorizont (communications and television), Ekran-M (television) and Nadezhda (navigation and rescue) spacecraft and the GLONASS system. In addition to the fixed-link system, mobile satellite communications systems are also being actively developed. Work is under way with a view to ensuring the operation of a personal communications system based on the Gonets system of low-Earth-orbit satellites. It is planned in the imminent future to make the transition to the new generation of satellites.

Assignments related to natural-resource and environmental monitoring are being performed by Meteor-3, Elektro, Resurs-01, Okean-01 and Resurs-F satellites. Photographic observation of the Earth's surface is also being carried out from the Mir manned orbital station.

Remote Earth sensing satellites are being used for a wide range of socio-economic and scientific research assignments. Spacecraft are currently in operation for the purposes of hydrometeorological (Meteor and Elektro), operational (Resurs and Okean) and photographic (Resurs-F) observation.

In order to achieve the most comprehensive approach possible to environmental monitoring tasks, it is planned to establish and expand, in a phased manner, the range of space facilities in operation within a future-oriented remote Earth sensing system.

Studies in the sphere of space technology and weightlessness physics have been directed towards the production under microgravity conditions of new organic and inorganic materials and the refinement of the technologies and equipment required for their production.

The main purpose of establishing a future-oriented space assembly is to complete the development of basic technologies for producing test parts for semi-conductors, "gradans" and other articles with practical industrial applications.

Under our space research programmes, attention is devoted in particular to the use of space technology in conducting more detailed study of high-energy space particles and of solar-terrestrial interaction, with a view to the development of a heliogeophysical monitoring system. Complex research of the Earth's magnetosphere is being continued, in addition to study of the interaction of processes on the Sun and in the circumterrestrial plasma with life on Earth.

During the 10 years of operation of the Granat orbital observatory, a detailed study has been made of several dozen galactic and extra-galactic sources, representing possible black

holes, neutron stars, X-ray novae and accumulations of galaxies and quasars. For the first time, sources emitting radiation in the annihilation gamma line of positronium have been localized.

Work is continuing in connection with the programme of research on the Earth's magnetosphere and ionosphere and of solar research under the international Coronas-I project (research on dynamic, active solar processes and the properties of solar cosmic radiation and electromagnetic solar radiation in the radio, visible, ultraviolet, X-ray and gamma bandwidths), as well as in connection with the international Advanced Photovoltaic and Electronic Experiments (APEX) project to study the effects of the artificially generated modulated electron fluxes and plasma beams on the Earth's ionosphere and magnetosphere.

Under the Prognoz-M2 (Interball) programme a system has been set up in space for conducting long-term fundamental research on processes taking place under the influence of solar radiation in the geomagnetic tail of the Earth's magnetosphere.

In addition to fundamental research, particular emphasis is laid on applied research projects for the forecasting of powerful magnetic storms giving rise to hazardous phenomena (induced currents) in power systems, power supply lines and data transmission networks.

Russia has amassed vast scientific and technical experience in connection with its manned space flight programmes. In the course of more than 13 years of operation of the Mir space station, a programme of research and experiments covering a broad spectrum of subject fields has been conducted.

An important factor in the development and strengthening of international space cooperation has been the Russian-American Mir-Shuttle and Mir-NASA joint programmes. Constituting phase 1 of the International Space Station (ISS) programme, they have allowed the partners to acquire invaluable experience in the conduct of joint long-duration flights.

A wide-ranging research programme has been carried out in recent years on board the Mir station by astronauts from the European Space Agency (ESA), Germany and France during long-duration flights under the Euromir and Pegasus programmes and also in the course of the expedition conducted under the Juno programme, etc.

The deployment of the ISS in orbit began with the launch in November 1998 of the first module Zarya. In December that year, the Unity module was connected to it. The ISS is scheduled to start operating as a permanently manned station as early as 2000.

In connection with the ISS project, the organization of the pure and applied research programme in the main traditional areas has acquired primary importance in new fields involving the use of orbital manned stations. Intensive work is being carried out in this regard by Russian and foreign scientists. Under the auspices of the Russian Space Agency (RKA) Science and Technology Coordination Council, a preliminary expert examination is being conducted and proposals are being selected for a programme of pure and applied research on board the Russian segment of the ISS.

The launch by Russian carrier rockets of foreign payloads (spacecraft) is an important and rapidly developing area of Russia's space activity. Russian and foreign partners have now established a number of joint ventures.

The system of rocket and space technology certification employed in Russia is the only such system of its kind and has provided the basis for achieving a high standard of reliability, safety and competitiveness of launch facilities on the world space market.

One of the most outstanding achievements in the realm of international cooperation has been the completion of the construction of a unique marine cosmodrome under the international project known as Sea Launch, involving the participation on the Russian side of the Energiya corporation.

An important socio-economic aspect of space activity is the deployment in the economic sphere and active industrial application of the latest scientific and technical advances. Work is currently under way to set up a system to ensure the intensive exploitation in different sectors of the economy of the potential offered by scientific and technical advances in the area of rocket and space technology. The necessary legislative and legal bases are now being established for the effective development of such a system.

Prospects and priorities for the development of the space activity of the Russian Federation at the beginning of the twenty-first century

With a view to the accelerated development of communications and television transmission infrastructure, it is planned to continue operating the existing Gorizont, Ekspress, Ekran-M and Gals space assemblies, while also developing new ones (Ekspress-K, Gals-R, Triada, Yamal, Gonets, etc.).

In the sphere of cartography and the investigation of natural resources, it is proposed to operate the photographic assemblies Resurs-F1M and Resurs-F2. There are plans to establish in the near future a more complete Resurs-DK space complex.

For the purposes of assignments in the areas of hydrometeorology and monitoring of the ozone layer, as well as radiation monitoring in circumterrestrial space, it is proposed to complete the establishment of a two-tier meteorological observation system from on board medium-Earth-orbit Meteor satellites and geostationary Electro satellites.

Research on gravitational and physical vacuum properties in the future will be performed in connection with the Newton project. It is planned to carry out gravitational experiments involving radio signals in regions extremely close to the Sun, as well as experiments to investigate the effects of gravitation on physical vacuum parameters and to study gravitational properties with the aid of test bodies.

Astrophysical research is to be carried out through the establishment of the Prognoz-M2 and Spektr space assemblies (RG, R and UF). Fundamental research in this field will, in particular, provide solutions to current scientific and technological problems in the field of power engineering.

The programme of research on solar-terrestrial interaction and on processes in circumterrestrial space and the physics of the ionosphere and biosphere is being carried out under the Interball and Rezonans Projects and in connection with heliophysical investigations through the launch of a space object into extended heliocentric orbit and through the Solar Probe and other projects.

With regard to investigations of planets and celestial bodies within the solar system, it is planned to carry out the Fobos-Grunt Project to study Mars and its satellites. Russian participation in the international Mars research programme is also envisaged.

Biomedical research will, as in the past, be directed towards the provision of scientific and methodological support for long-duration manned space flights and will be conducted with the aid of unmanned space assemblies and in the course of manned station flights.

The manned flight programme will be directed towards the coordination of wide-ranging assignments under the respective programmes operated by Russia, the United States of America, Japan, Canada and ESA.

In the area of space technology it is planned, in the near future, to develop fundamental and experimental research in the area of weightlessness physics and to develop basic technologies for producing unique materials and biological preparations with properties unobtainable on Earth.

After the year 2000 it is proposed, in the area of space materials research, to explore the possibility of moving from single-use spacecraft (Foton-type spacecraft) to reusable unmanned spacecraft.

The development of space facilities for navigational purposes is being conducted with a view to the provision of a global high-precision navigation service supporting an unlimited number of users. Under the GLONASS development programme, it is planned to establish integrated use of its radionavigational field and that of the United States GPS system (NAVSTAR).

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Abstract of the national paper of Kazakhstan

1. The space complex of Kazakhstan currently consists of a number of constituent elements engaged in work relating to the exploration and use of space, the wider introduction of space technology and the provision of space services. The main authorities responsible for national policy in this field include the National Aerospace Agency and the Ministry of Science and Higher Education. The country's space complex comprises the Baikonur launch site, facilities at the Sary Shagan 3-D test range and a number of industrial enterprises and scientific research centres and organizations directly or indirectly concerned with space activities.

2. The Baikonur launch site, established in 1955, was the main site in the former Union of Soviet Socialist Republics for the testing and utilization of the full range of rocket and space technology products and space facilities designated for scientific, economic and defence purposes. Kazakhstan's space activity commenced on 4 October 1957 with the launch of the world's first artificial Earth satellite. In 1994, the Baikonur launch site was leased to the Russian Federation. All Russian manned programmes and launches of spacecraft into geostationary and circumterrestrial orbit, as well as interplanetary missions, take place from that launch site.

3. Relations between Kazakhstan and the Russian Federation with respect to the Baikonur launch site are governed by the agreement on the main principles and conditions for the use of space facilities of the Baikonur complex and also by a special intergovernmental committee.

4. With regard to the move towards intensive marketing of space activity, each year sees an increased number of commercial launches from the Baikonur launch site, which has now, in effect, become a centre of business cooperation among the leading space powers.

5. Kazakhstan is engaged jointly with the Russian Federation and Ukraine in the design and implementation of a project for establishing, on the basis of elements of the Energiya-Buran space system, an environmentally friendly heavyweight rocket carrier (Sodruzhestvo project) and in the implementation of the Dnepr programme involving the SS-18 converted intercontinental ballistic missile.

6. National scientific research institutes and physics technology centres are carrying out assignments in the field of pure and applied scientific research and with a view to the introduction of modern space technologies and know-how.

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7. Kazakhstan's activities in the realm of fundamental space sciences are conducted principally through research carried out at the institutes of astrophysics, of ionospheric studies and of space research.

8. Space flights by Kazakh cosmonauts have laid the foundations for the establishment of national experimental space research programmes on board the Mir orbital station. The Polet-M2 programme for 1999 comprised five main segments: applied physics research, space biotechnology and biomedicine, geophysical research, natural-resource monitoring and information coverage.

9. Studies relating to the reception and processing of data on the remote sensing of Earth and digital mapping are being carried out at the institutes of space research, of nutrition, of soil sciences and of geological sciences, at the National Centre of Radioelectronics and Communications, and by the Committee on Land Resource Management of the Ministry of Agriculture.

10. Two approaches to the use of space technology resources have already been established in Kazakhstan and are being further developed. Space technology is seen, firstly, as a means of providing national economic solutions, as in the case of natural-resource monitoring and land mapping for the evaluation of land resources, the operational monitoring and evaluation of soil-vegetation resources, mineral prospecting, geophysical monitoring, space data reception and processing, and the like. The second approach is focused on the advancement of space technology and development projects, as well as participation in international cooperation in fields such as space materials science, the development of new space technology resources and experimental facilities, space data reception and processing, and so forth.

11. Kazakhstan attaches great importance to the training of scientific research and engineering personnel. On the basis of the existing network of higher educational establishments, it has been possible, with minimal expenditure, to restructure academic programmes with a view to creating a pool of specialists required for the national space complex. In this area, particular success has been achieved in promoting cooperation with a number of higher educational establishments in the Russian Federation and with the International Space University and the Centre for Space Science and Technology Education in Asia and the Pacific.

12. In accordance with the Master Plan for the Development of the Space Complex of the Republic of Kazakhstan, elaborated in 1988, the strategic goal of the complex is to make it possible to exploit more fully the unique possibilities offered by space technology in the interests of enhancing national security and providing solutions to socio-economic and scientific problems, while also ensuring the application of the international agreements concluded by Kazakhstan in connection with its space activities.

13. The attainment of this strategic goal must be based on the following:

(a) Specifically targeted financing of the space complex through the national science and technology programme;

(b) Integration of the scientific-technical, prototype-design and industrial testing infrastructure supporting space technology applications in the area of space communications, telecommunications, satellite navigation and air traffic control, remote sensing of Earth, exploration of outer space and space materials science;

(c) International cooperation; and

(d) Attraction of foreign investment.

14. At the forty-ninth session of the General Assembly, Kazakhstan was accepted as a member of the Committee on the Peaceful Uses of Outer Space. That was followed by the country's accession to international agreements and treaties in the area of space activity.

15. Kazakhstan is committed to cooperation with the member States of the Commonwealth of Independent States (CIS) in the exploration and conquest of outer space in the light of the shared geopolitical interests and traditionally close ties of those countries in the area of science and technology. Such cooperation proceeds on the basis of bilateral and multilateral agreements.

16. With a view to gaining experience in the organization of space activity and establishment of its own aerospace sector in line with international standards, Kazakhstan is seeking to establish close relations with leading space agencies such as the National Aeronautics and Space Administration (NASA) of the United States of America and the European Space Agency (ESA). Cooperation is also being built up gradually with countries in Asia and the Pacific.